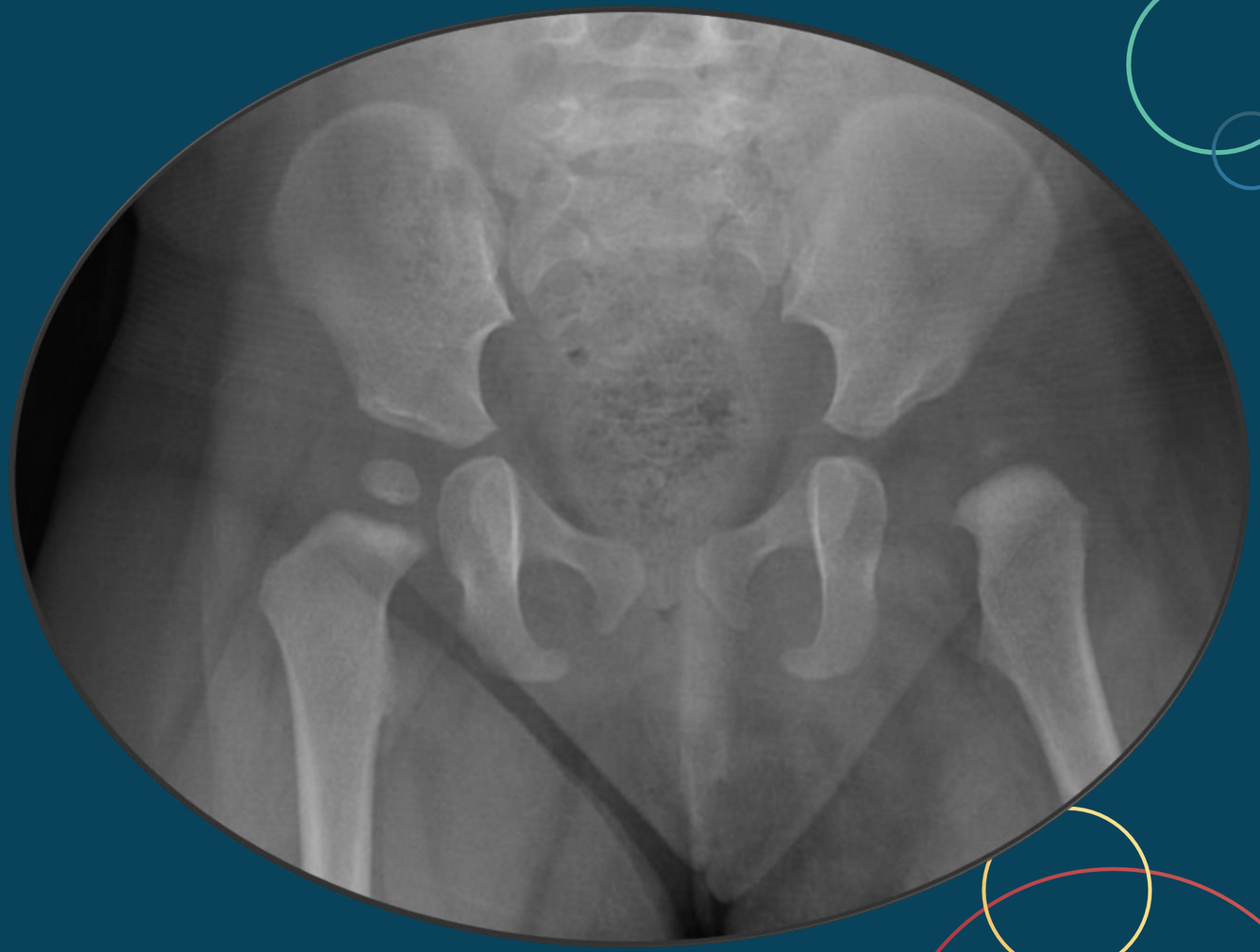
Hip Dysplasia: The Young and Old(er)



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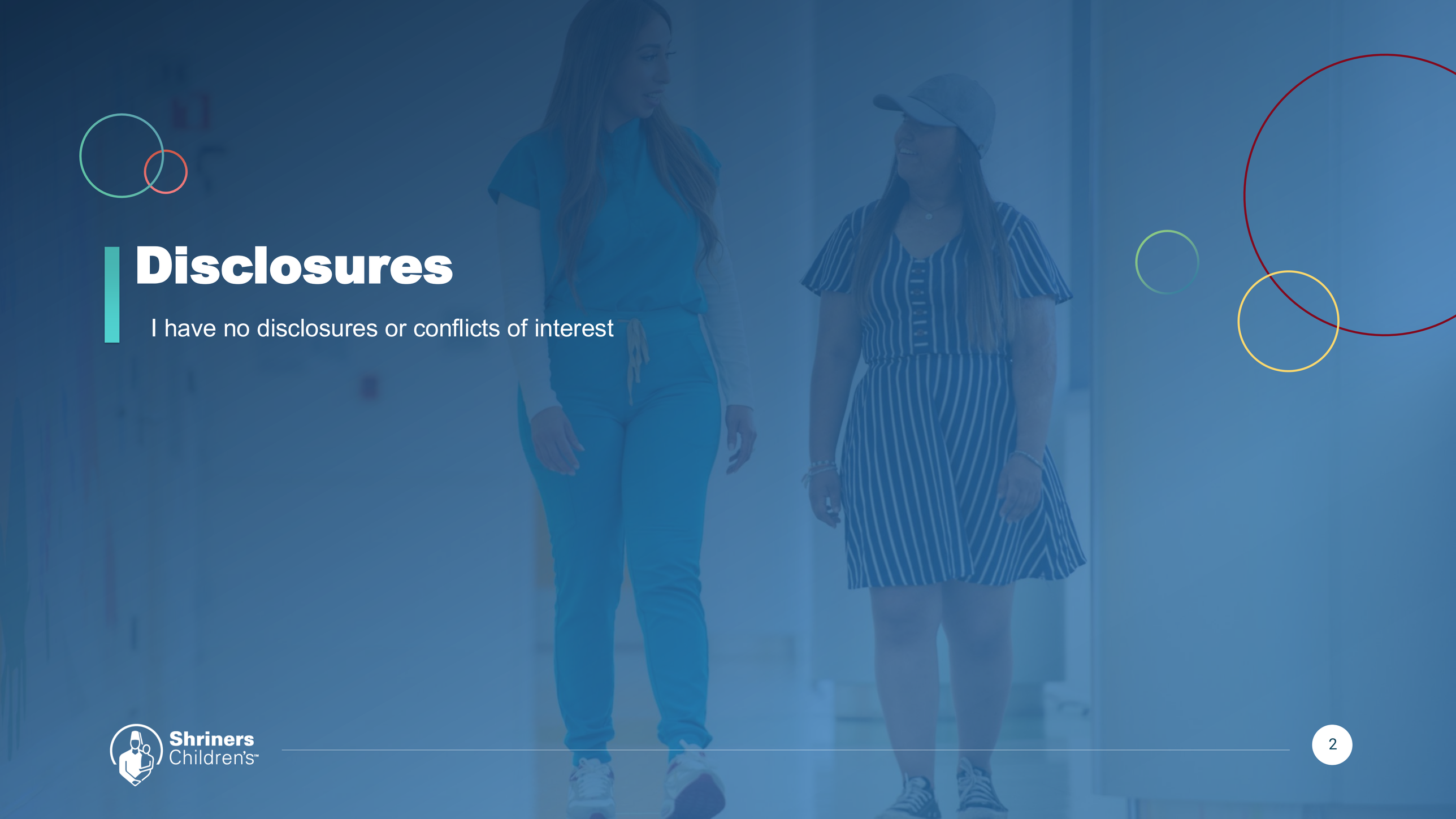
Disclosures

I have no disclosures or conflicts of interest



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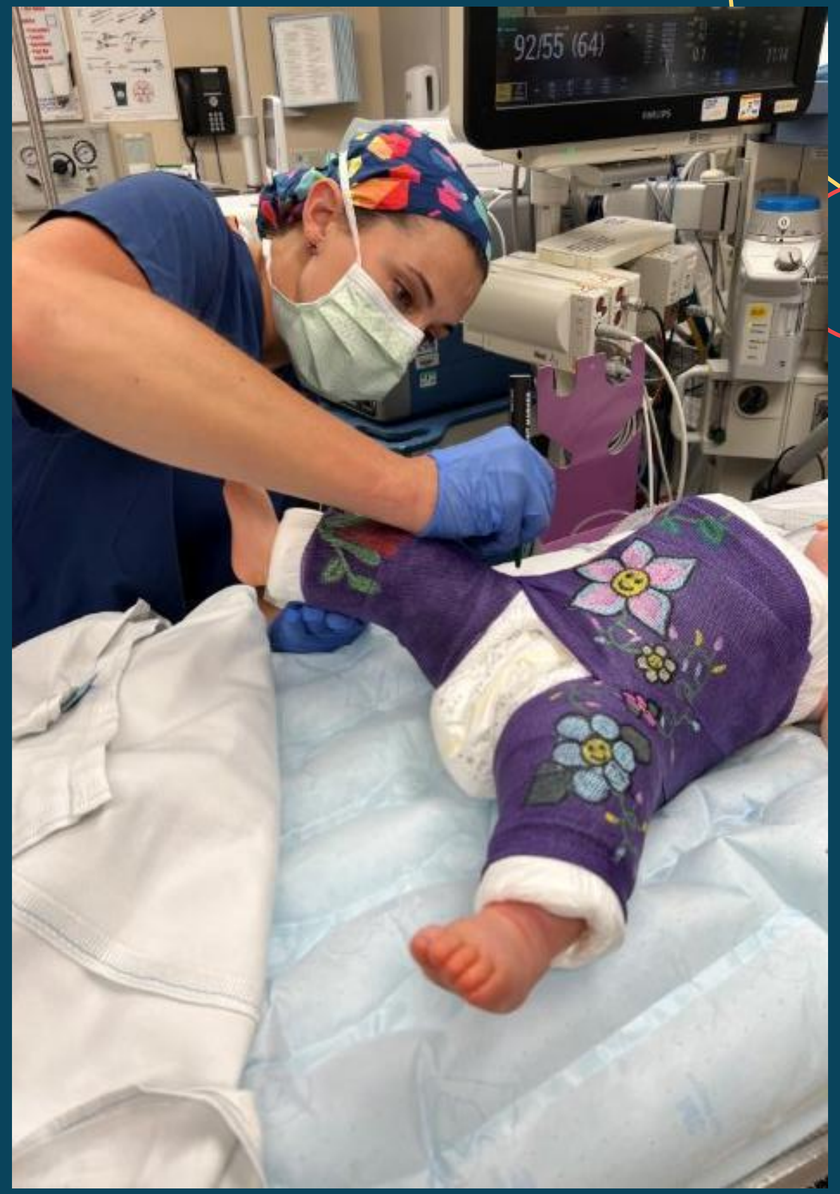
I just really love a baby hip



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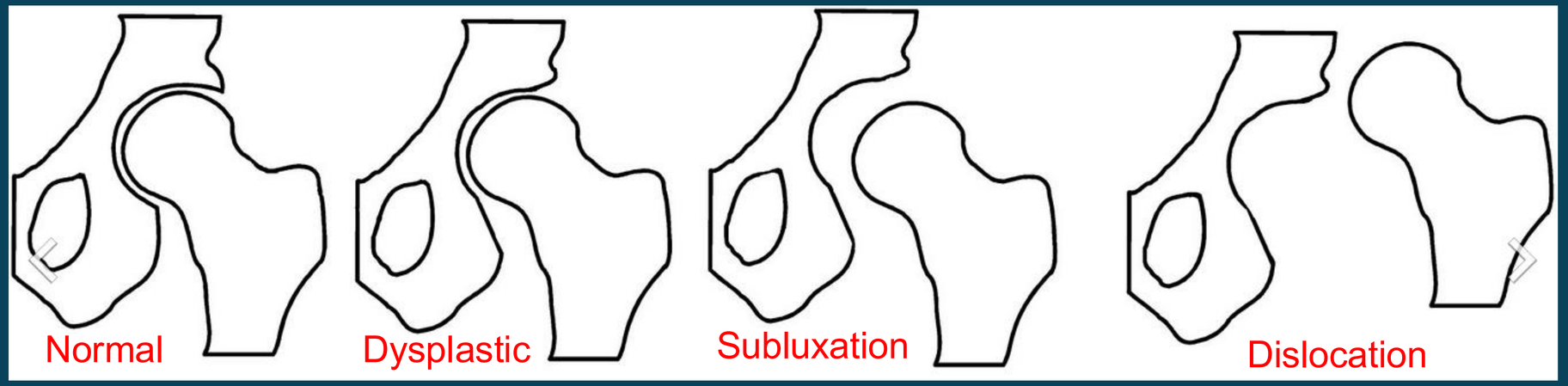
Educational Aims

- Definitions
- Normal development of the hip
- Epidemiology
- Physical examination
- Imaging studies
- Treatment
- Residual Dysplasia into Adulthood

Definitions

- Dysplasia: abnormal development
- Hip Subluxation: migration of the femoral head, but a portion is still contained
- Hip Dislocation: migration of the femoral head that is no longer contained



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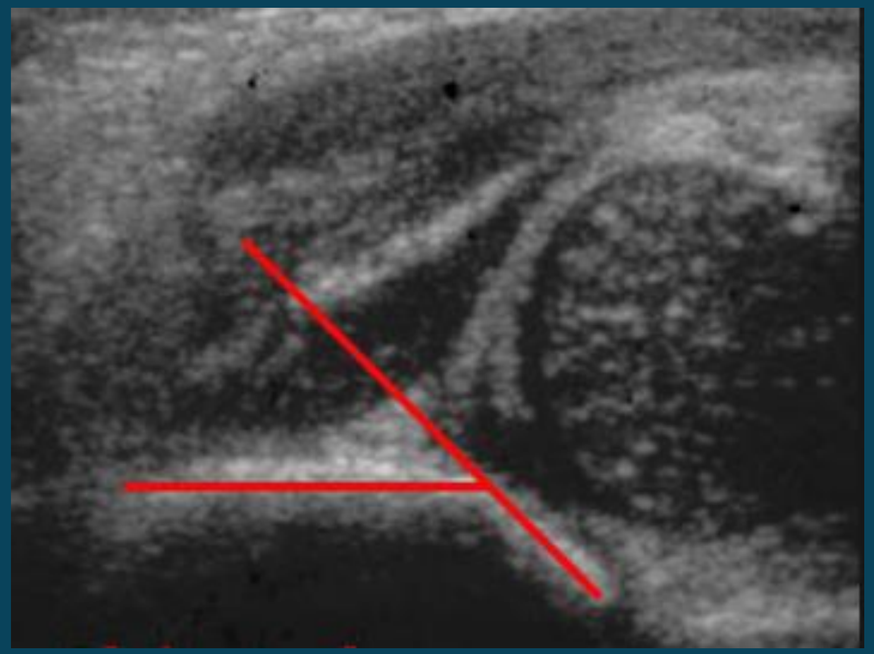
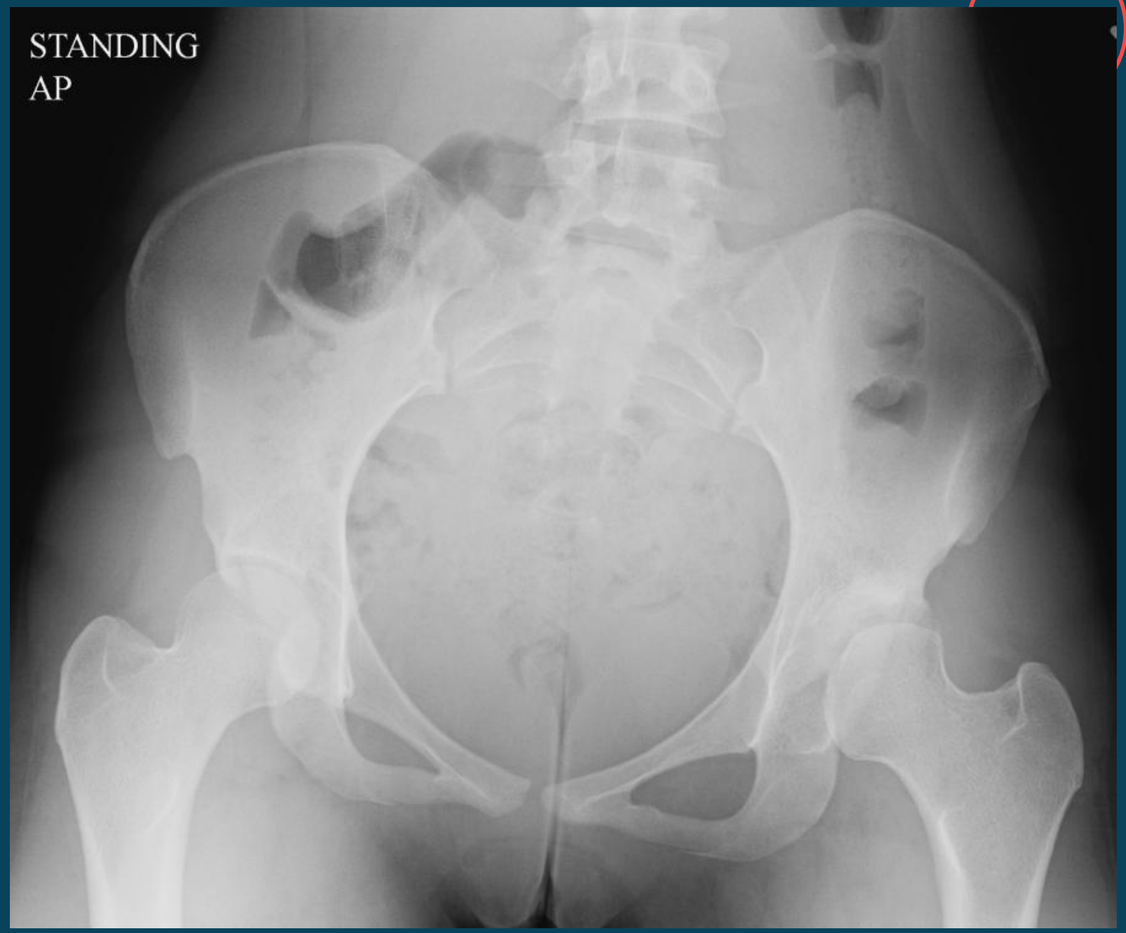
Hip Dysplasia

- Comes in 2 flavors:
  - Infant
  - Adolescent / young adult



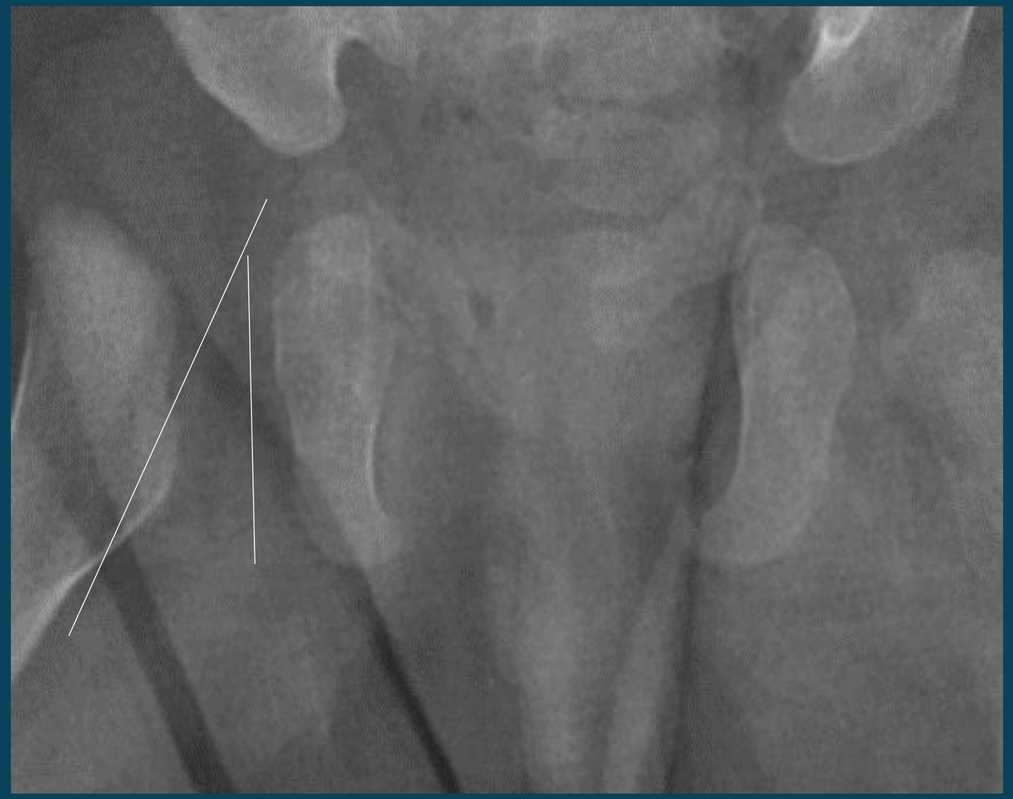


Epidemiology

Epidemiology

- Most common orthopaedic condition in newborns
- Dysplasia 1:100
- Dislocation 1:1000

Dislocated:
-femoral metaphysis is laterally migrated



Dysplastic:
-shallow upsloping acetabulum

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Risk factors for infant dysplasia

- First born
- Female (6:1)
- Breech positioning
- Left > right hip
- “Tight packaging”
- Oligiohydraminos
- Positive family history:
    - At least one parent = 12% risk
    - One parent + one sibling = 36% risk

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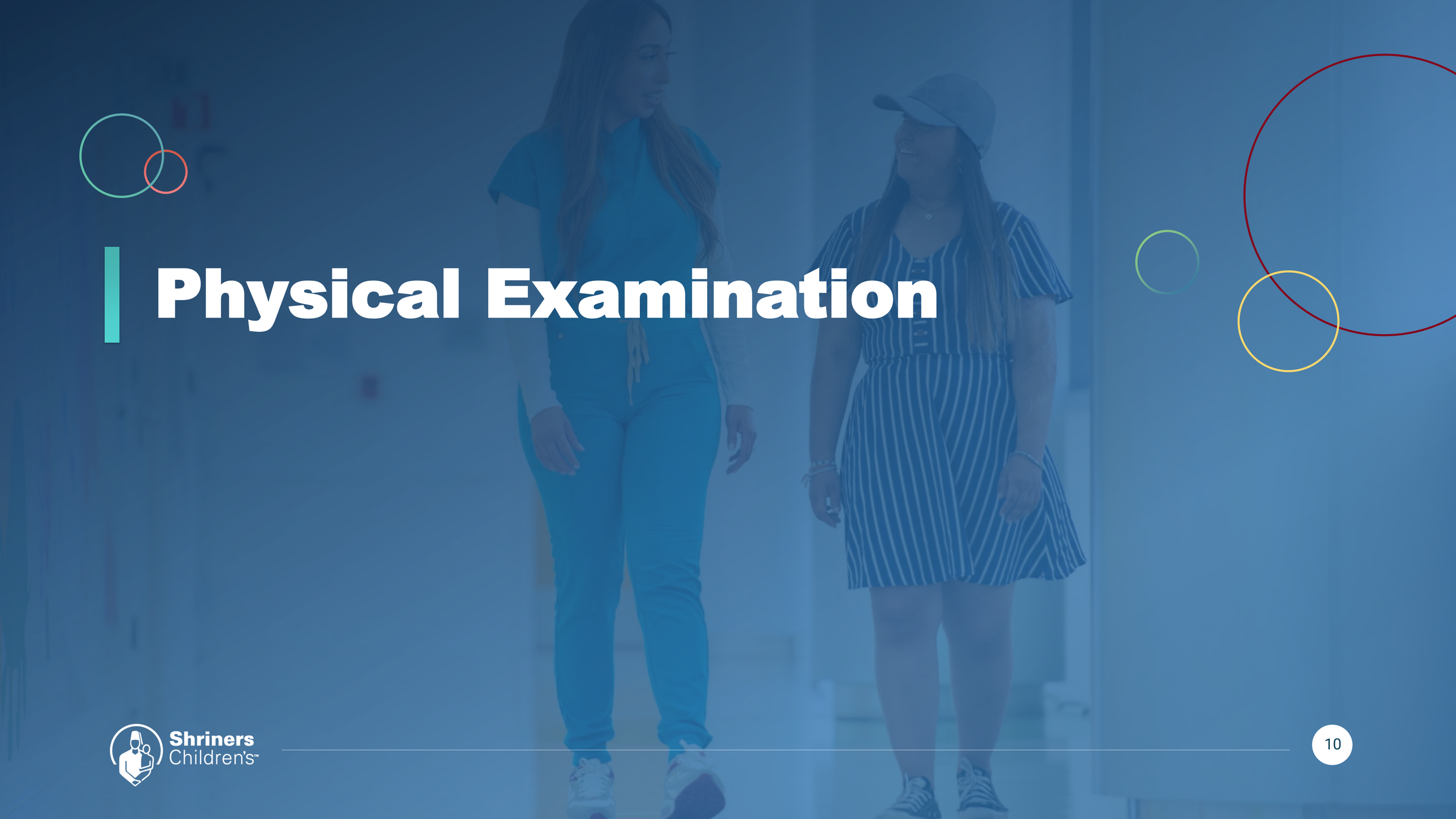
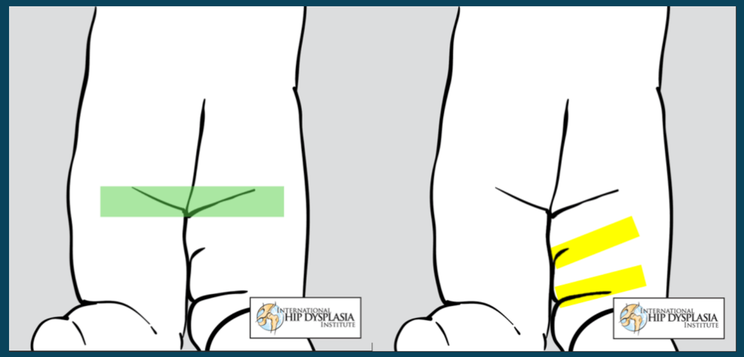
Physical Examination



Standardized Approach

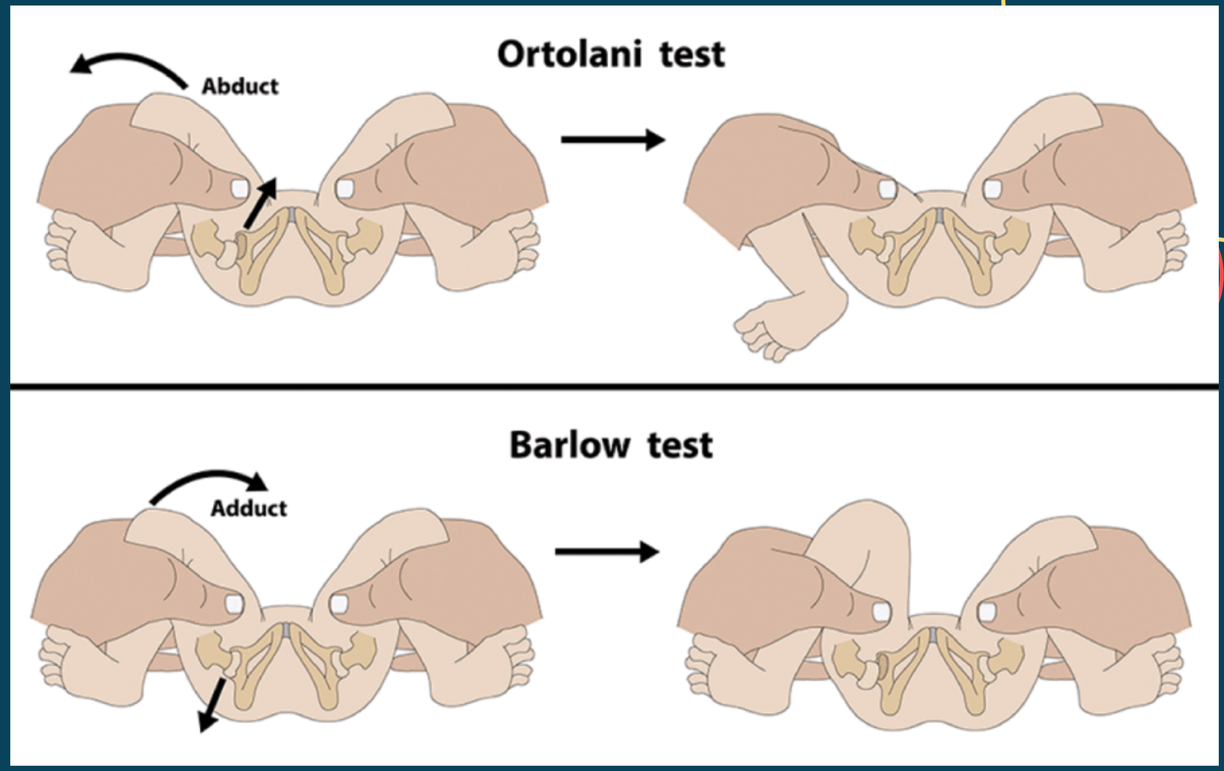
1. Galeazzi Sign
    - Pertains to a dislocated hip.
    - Not a subluxed hip.

2. Thigh Folds



3. Hip Abduction

Physical examination



- Barlow:
  - “Bad” as to push hip out
  - Dislocate hip
- Ortolani:
  - Hip rests dislocated
  - Ortolani positive means examiner can reduce hip on exam
- Only works for the littles!
  - Age < 3 months before their tissue tension increases

Physical examination (walking)

- Pelvic obliquity
- Lumbar lordosis
- Trendelenberg gait
- Unilateral toe walking

Imaging

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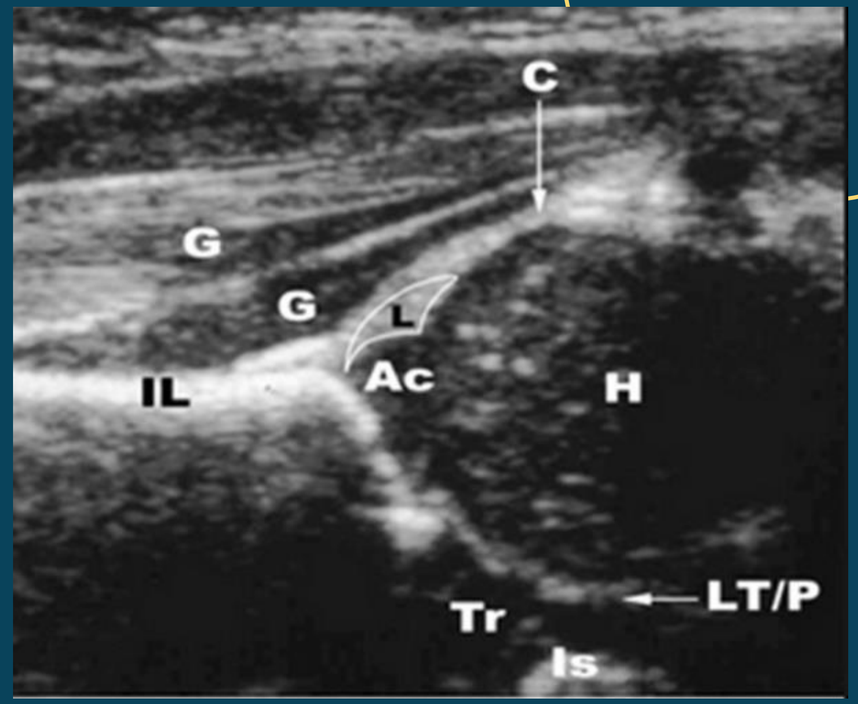
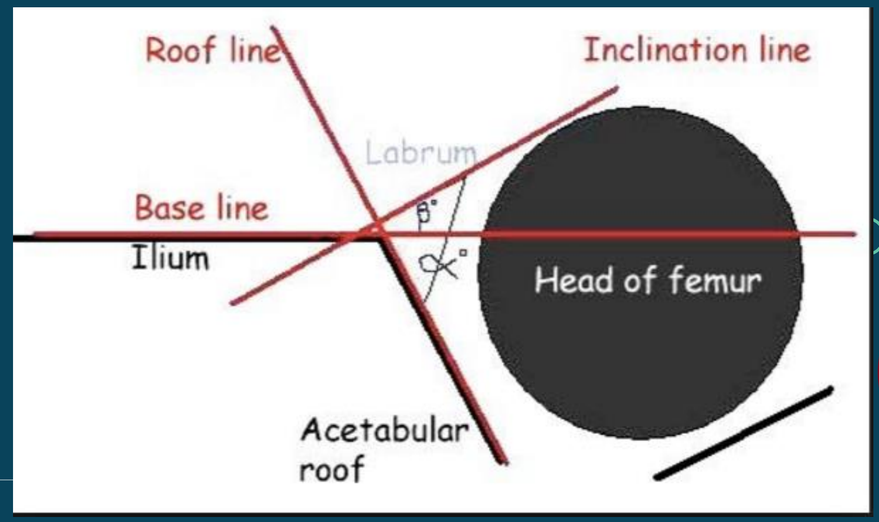
Imaging: Ultrasound

- Useful before femoral head ossification

- Allows view of:
  - Bony acetabulum
  - Femoral head
  - Labrum
  - Ligamentum teres
  - Hip capsule
  - Triradiate cartilage





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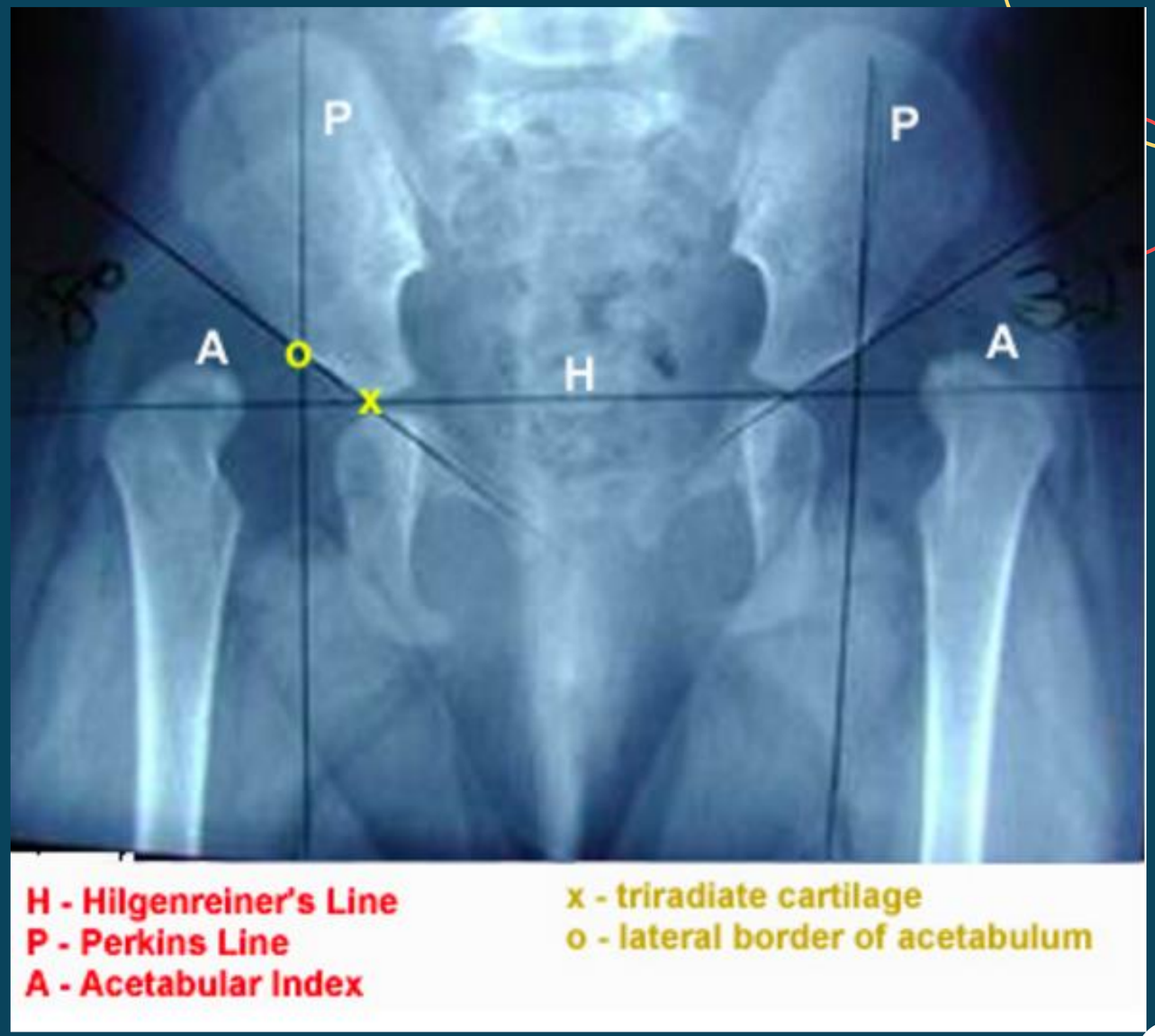
Imaging: X-ray

- After 4-6 mon
- Hilgenreiner’s line
- Perkins line
- Shenton’s line
- Acetabular index



Treatment

Treatment: Pavlik Harness

- Aka, a “dynamic splint”
  - DDH <6 mo
  - Reducible hip (aka, Ortolani positive)
  - Requires normal muscle function
  - Success rate: 90%

Treatment: Hip Orthosis

If Pavlik harness fails or larger baby:

- Abandon if fails x3-4 weeks
- Semi-rigid abduction brace x3-4 weeks
- We have these in our cast rooms, so parents are able to get an extra

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Treatment: Closed Reduction

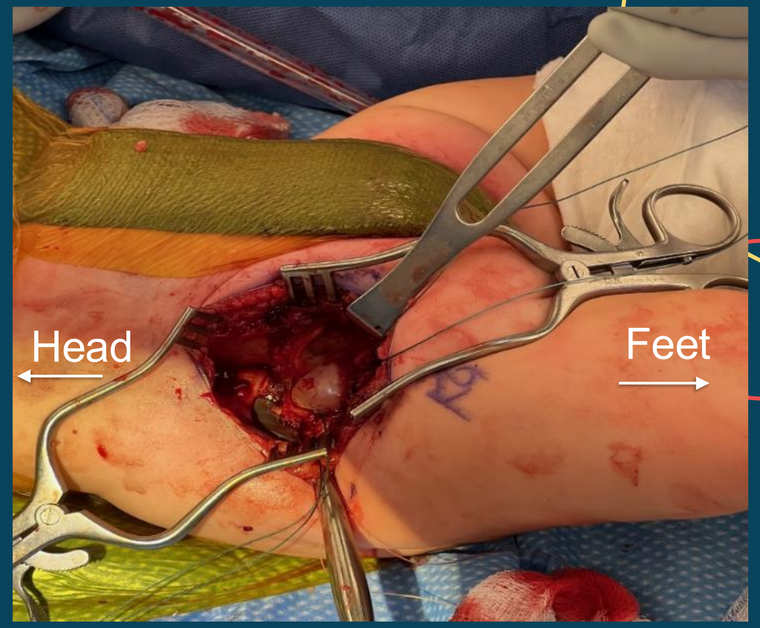
- Closed reduction and spica cast:
  - Failure of brace treatment
  - DDH 6-18 mon

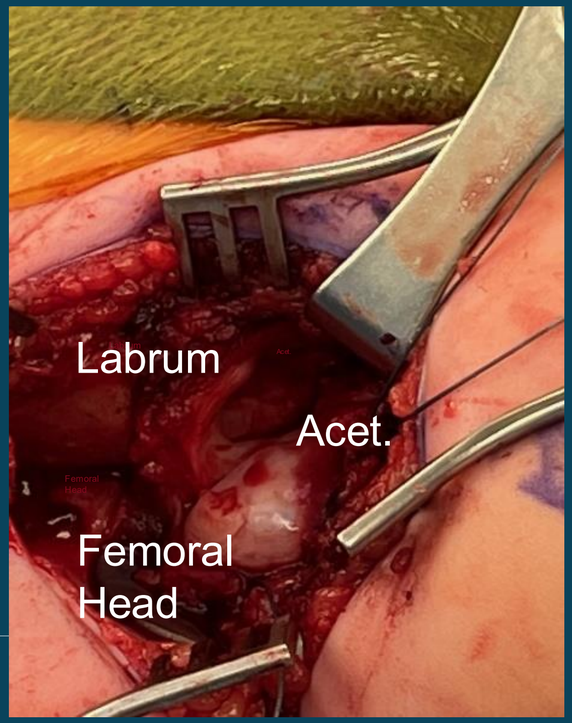
- Surgery:
  - Hip Arthrogram
  - Adductor Tenotomy
  - Closed Reduction
  - MRI under same sedation
  - Cast for 12 weeks

Treatment: Open Reduction

- Open reduction:
  - Failure of closed reduction
  - DDH >18 mo

- Hip Arthrogram
- Adductor Tenotomy
- Open reduction meaning clean out blocks to reduction
- MRI under anesthesia
- Spica cast for 6 weeks then orthosis for 6 weeks (variable)





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Complications

- Osteonecrosis:
  - Excessive forced abduction
  - Previous failed closed treatment
  - Repeat surgery
- Delayed diagnosis
- **Recurrence**
- Transient femoral nerve palsy

- Not a complication:
  - the affected side will never resemble the non-affected hip
  - Proximal Femoral growth disturbance (misshapen head)
  - A slightly stiff hip initially. This is a good thing!

No PT for these kids

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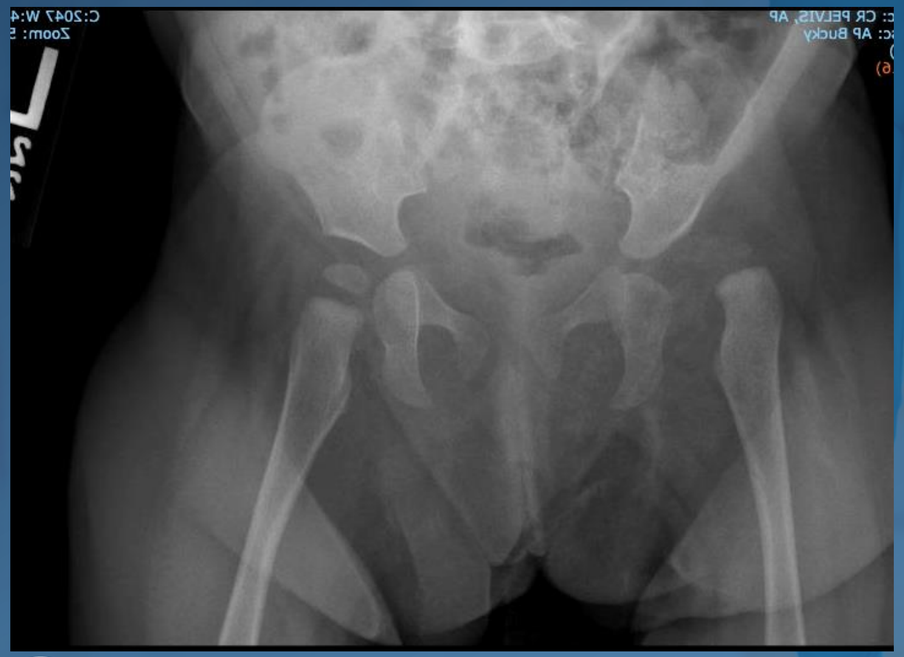
Summary of Infants

- Hip dysplasia is common: 1 in 1000 kids
- Dysplasia differs from subluxation or dislocation
- Exam:
    - Galeazzi & Abduction are easy maneuvers
    - Barlow/Ortolani for <3 mo
- Acetabular dysplasia is typically what is monitored on annual x-ray
- Treatment algorithm:
  Pavlik → Rigid Orthosis → Closed → Open Reduction

Old(er) Hip Dysplasia



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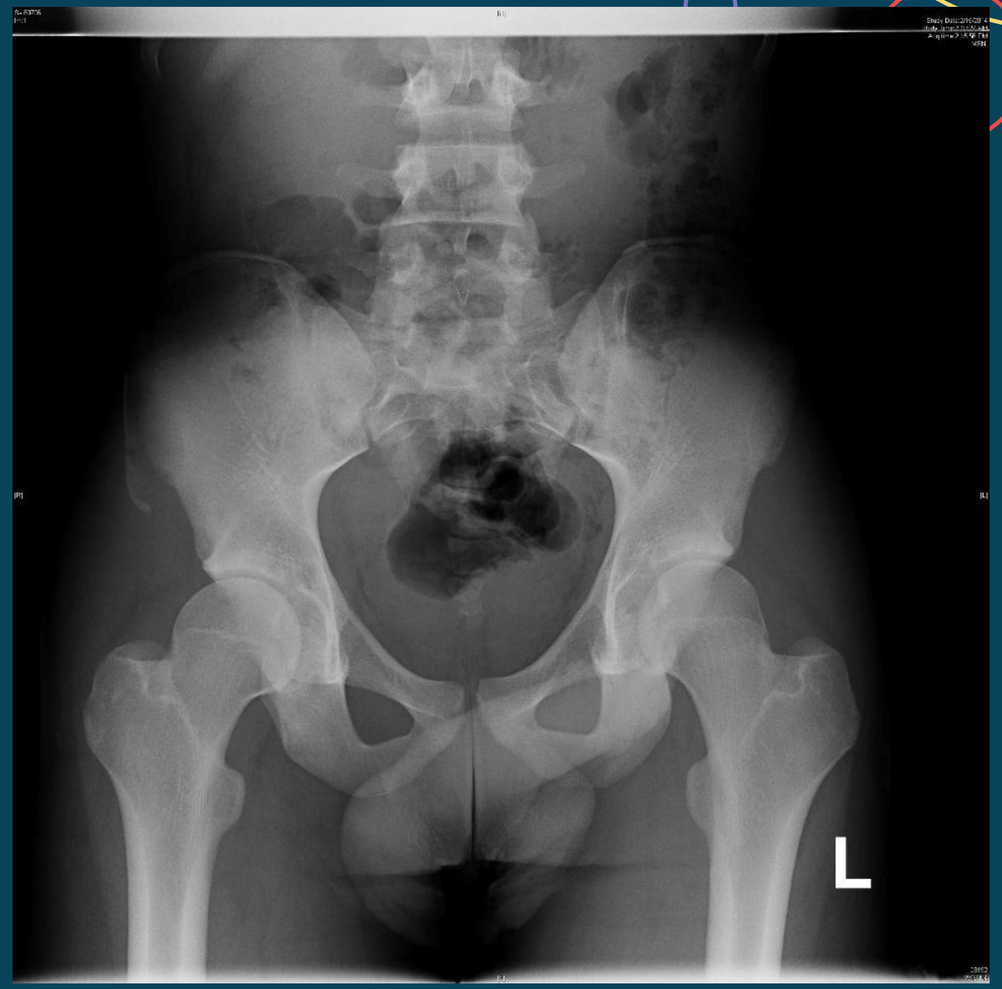
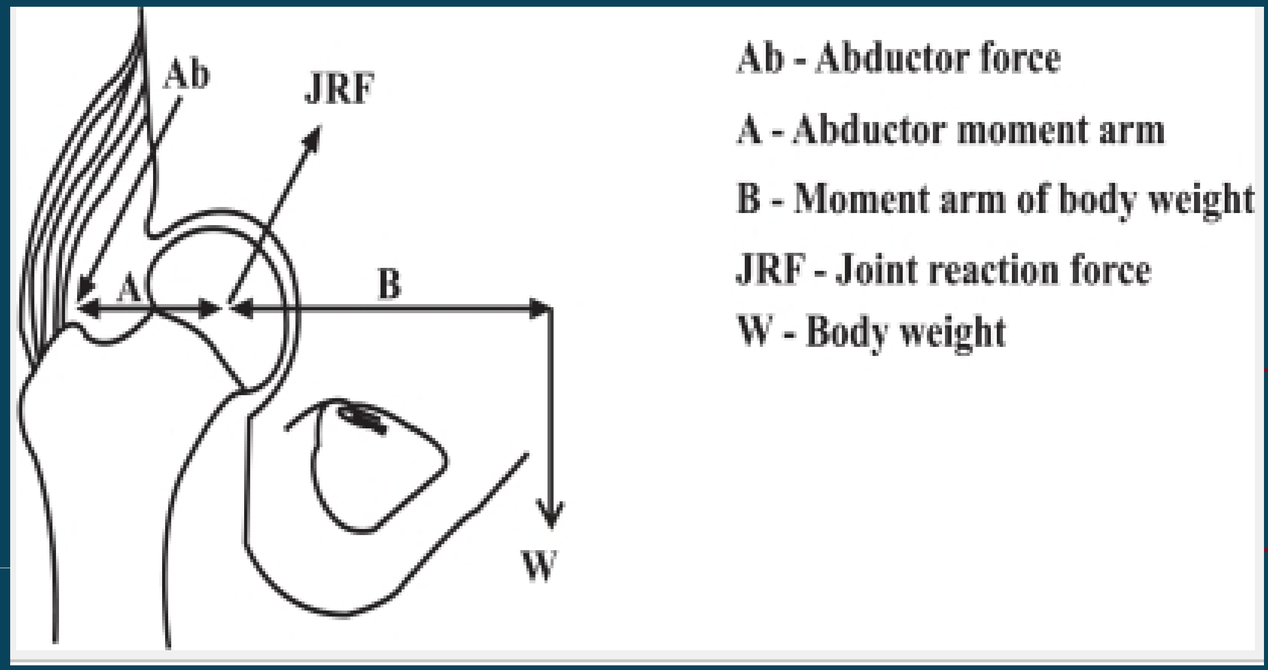
Epidemiology

- Incidence hip dysplasia: 3-5%
- Females more commonly affected, but males often have concurrent pathology (FAI, retroversion)
- Leading cause of THA before age 60



Etiology

- Abnormal anatomy
    - Residual Childhood dysplasia
- Mechanical Disadvantage
    - Chronic edge-loading & high mechanical stress on rim
- Pre-existing Damage
    - Micro-instability, labral tears



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Adolescent Dysplasia due to Residual DDH

- Residual acetabular dysplasia after Pavlik/brace treatment: ~30%
- 36% of patients with adolescent dysplasia had a history of DDH in childhood
- Theoretically delayed ossification of the TRC and insufficient development of lateral secondary ossification centers
- Typically female, but occasionally males with concurrent pathology
- Infant DDH usually unilateral; Adolescent dysplasia often bilateral

The Spectrum: Babies to Adults

- Screen? Until skeletal maturity; or starting again at age 8
- What about radiation induced effects?
- What is residual dysplasia?
    - Sarkissian 2015; 30@6mo, 28@12mo
    - Novais 2018: normative values but not definition abnormal
    - Caffey: AI >30* always abnormal
        - 24 months: nl girls 18, boys 19

Thank You!

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